

Heat Exchanger With Offset Interior Dimples

Abstract

A tubular heat exchanger has at least one pair of dimples which are extruded
5 into at least one tube of the heat exchanger by deforming the tube wall inwardly. The
dimples of each pair are in generally facing relationship, but are offset with respect
to each other along a longitudinal axis of the tube, which slows down the flow of
flue gas in the tube when the heat exchanger is in operation and increases the
turbulence of the gas, thereby enhancing the transfer of heat from the flue gas to air
10 flowing across the outer surfaces of the heat exchanger. The offset design allows each
dimple to protrude beyond the centerline of the tube, which alters the direction of the
flue gas flowing in the tube.